

# NEW SPECIES OF ORCHIDACEAE FROM SOUTH-EASTERN AUSTRALIA

DAVID L. JONES\*

## ABSTRACT

Jones, David L. New species of Orchidaceae from south-eastern Australia. *Muelleria* 8(2): 177–192 (1994). — Nine new species of Orchidaceae from south-eastern Australia (with one extending to New Zealand) are described as new: *Caladenia amoena*, *C. atrata*, *C. hillmanii*, *Diuris ochroma*, *Prasophyllum suaveolens*, *Pterostylis atrans*, *P. commutata*, *P. monticola* and *P. tasmanica*. The new combination, *Pterostylis valida*, is made for *Pterostylis squamata* var. *valida* Nicholls.

## INTRODUCTION

Continuing research into the systematics of Australian Orchidaceae has revealed the following species, described here, as new. All are from New South Wales, Victoria or Tasmania, with one extending to New Zealand. The descriptions facilitate the preparation of accounts for the *Flora of Australia*, the *Orchid Atlas of Tasmania*, the *Flora of Victoria*, and the *Catalogue of New Zealand Orchidaceae*.

## TAXONOMY

*Caladenia amoena* D.L.Jones sp. nov.

*C. concinnae* (Rupp) D.L.Jones et M.Clements affinis sed floribus parvioribus, petalis et sepalis lateralis pendentibus, osmophoris sepalorum glandulosis minus, labello parvior, callis rubrioribus congestis minus, callis basalibus angustioribus et columna anguste differt.

TYPUS: Victoria: cult ex Wattle Glen, 37°39'10"S, 145°11'45"E, 24 Sept. 1992, P.Branwhite s.n. (D.L.Jones 10160) (HOLOTYPUS: CBG; ISOTYPUS: MEL).

Hirsute, tuberous, terrestrial herb growing singly or in loose groups. *Leaf* lanceolate, 3–8 cm × 7–9 mm, erect, dull green, purple-blotched at the base, densely hirsute with patent, eglandular trichomes to 4 mm long. *Inflorescence* 5–12 cm tall, wiry, reddish towards the base, densely hirsute with trichomes similar to those on the leaf mixed with shorter glandular trichomes. *Sterile bract* narrowly obovate-spathulate, 15–18 mm × 4–5 mm, involute, spreading, externally hirsute, obtuse. *Fertile bract* ovate-elliptical, 13–15 mm × 6–7 mm, closely sheathing, externally hirsute, subacute. Flower usually solitary, c. 12–14 mm across, cream-green heavily suffused with red, osmophores very small, floral fragrance undetectable; dorsal sepal erect and incurved, lateral sepals and petals downcurved close to the ovary. *Dorsal sepal* linear to linear-lanceolate, 20–25 mm × 2.5–3 mm, narrowed to a linear-involute section just before the osmophore; osmophore 1.5–2.5 mm × 0.5–0.7 mm, with uncrowded, sessile, dark brown, ellipsoid to globular glandular cells. *Lateral sepals* oblong-lanceolate, 17–23 mm × 3–3.5 mm, slightly falcate, narrowed to a linear, involute section then terminated by an osmophore similar to that on the dorsal sepal. *Petals* linear-lanceolate, 15–18 mm × 1.3–1.6 mm, long-acuminate. *Labellum* articulated on a short claw c. 2 mm × 1.3 mm, yellowish green with a reddish mid-lobe and reddish calli, 3-lobed. *Lamina* cordate in outline when flattened, 9–12 mm × 8–11 mm, obliquely erect in proximal half, strongly recurved in distal third; lateral lobes 3–4 mm across, obliquely erect, proximal margins entire, distal margins with 1–5 obliquely erect, flat, linear

\* Australian National Botanic Gardens, GPO Box 1777, Canberra, A.C.T., Australia 2601

lobes 0.6–1.2 mm long; mid-lobe deltate when flattened, 4–4.5 mm × 3.5–4 mm, margins with 6–8 pairs of broad, porrect, obtuse teeth, decrescent towards the apex. *Lamina calli* in 4 irregular rows, moderately congested and occupying about 1/3 of the ventral surface of the lamina, dark reddish, those in proximal half stalked, decrescent and sessile towards the apex; basal calli c. 3 mm long, stalked, head elongate-clavoid, c. 0.8 mm across, surface very irregular; longest lamina calli c. 1.8 mm long, hockey-stick-shaped, stalked, irregular in shape when viewed from above, surface irregular. *Column* erect and incurved, 8–9 mm × 3.3–3.5 mm, transparent with fine reddish striae and markings, lower dorsal surface with stalked, glandular trichomes, broadly winged; basal glands asymmetrically ellipsoid, c. 2 mm × 0.6 mm, shiny yellow with a red base. *Anther* c. 3 mm × 2.5 mm, yellow, with a linear rostrum c. 0.6 mm long. *Pollinia* 4, c. 2.5 mm long, broadly boomerang-shaped, flat, yellow. *Stigma* more or less circular, c. 2 mm wide, sunken. *Capsule* not seen. (Fig. 2 a–c)

#### DISTRIBUTION AND HABITAT

Endemic to southern Victoria where known from a few localities near Melbourne. It grows on ridges and sheltered slopes in dry sclerophyll forest in shallow clay loam over Silurian siltstone.

#### FLOWERING PERIOD

Late August to early October.

#### NOTES

*Caladenia amoena* is similar in many respect to *C. concinna* but can be distinguished by its generally smaller flowers with the lateral sepals and petals downcurved close to the ovary and imparting a drooping appearance. It also has sepalline osmophores which are very short and sparsely glandular (prominent, relatively long and moderately dense in *C. concinna*), a smaller labellum with reddish, less congested calli, narrower basal calli on the labellum and a narrower column. *Caladenia concinna* has flowers 22–26 mm across, labellum 13–16 mm long, and column 5.5–6 mm wide. *Caladenia toxochila* also has some similarities but its flowers are darker coloured with prominent sepalline osmophores and much thicker, blackish, congested lamina calli. The distribution of each of these taxa is distinct with *C. concinna* being confined to the south-western Plains of New South Wales, *C. toxochila* occurring in north-western Victoria and South Australia and the new species from southern Victoria. A recently discovered group of *C. amoena* on private land was destroyed during clearing operations soon after its discovery (C. Beardsell pers. comm.).

#### CONSERVATION STATUS

Reduced to great rarity by alienation of its habitat, and apparently now known only from private land; suggest 2E by criteria of Briggs & Leigh (1988).

#### ETYMOLOGY

From the Latin *amoenus*, pleasant, delightful.

#### *Caladenia atrata* D.L.Jones sp. nov.

*C. cucullatae* Fitzg. affinis sed statura humiliore, floribus 1 vel 2, segmentis perianthii angustioribus, denigratis per glandes densas, callis labellorum sparsim dispositis differt.

TYPUS: Tasmania, hill 2.5 km north-east of Ferntree, 42°55'S, 147°16'E, 29 Oct. 1990, D.L.Jones 6805 & C.H.Broers (HOLOTYPE: CBG; ISOTYPE: CBG, HO, MEL, NSW, AD).

Hirsute, tuberous, terrestrial herb growing in loose groups. *Leaf* 6–13 cm × 3–3.5 mm, linear, erect, dark green, sparsely hirsute with a mixture of patent,

transparent eglandular trichomes to 1.5 mm long and shorter glandular trichomes. *Inflorescence* 12–20 cm tall, very slender, wiry, densely beset with short glandular and eglandular trichomes similar to those on the leaf. *Sterile bracts* 6–8 mm  $\times$  2.5–3 mm, narrowly obovate-lanceolate, closely sheathing, subacute, externally hirsute. *Fertile bracts* similar. *Flowers* one to four, c. 1.8 cm across, white internally, blackish externally from a dense covering of sessile, ovoid, black glands, the mid-lobe of the labellum dark purple; dorsal sepal erect and strongly incurved, lateral sepals porrect and divergent, petals spreading, curved forwards and often upcurved in distal third. *Dorsal sepal* 10–12 mm  $\times$  2.4–3 mm, obovate, cucullate, apex broadly obtuse, apiculate. *Lateral sepals* 10–14 mm  $\times$  2–2.5 mm, asymmetrically lanceolate, falcate, divergent, apex subacute to acute. *Petals* 10–13 mm  $\times$  2–2.5 mm, linear-lanceolate, falcate, acuminate. *Labellum* articulated on a short claw, white or pinkish with dark purple spots and a dark, purple mid-lobe. *Lamina* 4.5–6 mm  $\times$  3.5–4.5 mm, ovate in outline when flattened, erect in proximal half then curved forwards, apex recurved; lateral lobes c. 1 mm wide, erect and column-embracing, lateral margins entire, apical margins entire or with a short lobe; mid-lobe c. 2.5 mm long, recurved, with c. 3 pairs of marginal calli similar to those on the lateral lobes and another three or four pairs of flat blunt teeth decrescent and reduced to denticulations at the apex. *Lamina calli* in four irregular rows extending two-thirds of the length of the mid-lobe, stalks white, heads purplish-black; basal calli 2, c. 0.7 mm long, shortly stalked, head elongate-ovoid, densely papillate; longest lamina calli c. 1 mm long, long-stalked (to 0.7 mm long), head ovoid, erect or curved forwards, densely papillate. *Column* 5.5–6.5 mm  $\times$  c. 2.3 mm, erect and recurved, gibbous in the distal half, broadly winged, greenish with red blotches, a few stalked glandular trichomes on the dorsal surface; central ridge c. 0.7 mm wide. *Anther* c. 1 mm  $\times$  1 mm, cream, papillate, with a short linear rostrum. *Pollinia* 4, c. 1.8 mm long, cream, flat. *Stigma* c. 1 mm wide,  $\pm$  circular, sunken, green. *Capsule* not seen. (Fig. 1 a–g).

#### DISTRIBUTION AND HABITAT

Endemic in Tasmania where apparently restricted to southern areas. *Caladenia atrata* is typically found in hilly districts and grows in stunted open forest with a sparse understorey. Soils are commonly skeletal, grey to white, powdery when dry and developed on Permian mudstone and occasionally sandstone (D.Ziegeler pers. comm.). Occasionally the species grows on loams (H.Wapstra pers. comm.).

#### FLOWERING PERIOD

Late October to December.

#### NOTES

*Caladenia atrata* is closest to *C. cucullata* Fitzg. but can be readily distinguished by its shorter habit (to 35 cm tall in *C. cucullata*), flowers which are intensely white inside and blackish or dark reddish outside from a dense vestiture of sessile, ovoid black to red-black glands on the exterior surface of the tepals (sparse greenish to brown glands in *C. cucullata*), narrower (2.3 mm rather than 4 mm), more distinctly pointed tepals and fewer, sparser calli on the labellum. The flowers of *C. cucullata* exude a lemony fragrance while that from *C. atrata* has been likened to the smell of Cointreau (D. Ziegeler pers. comm.). *Caladenia atrata* is endemic to southern Tasmania whereas *C. cucullata* is widely distributed in the mainland states of south-eastern Australia and is absent from Tasmania. *Caladenia atrata* has been wrongly linked to *C. gracilis* by workers in Tasmania. *Caladenia gracilis* can be distinguished from both *C. cucullata* and *C. atrata* by its much larger flowers which exude a strong musky fragrance and a labellum which has very broad lateral lobes and a small, relatively narrow mid-lobe.



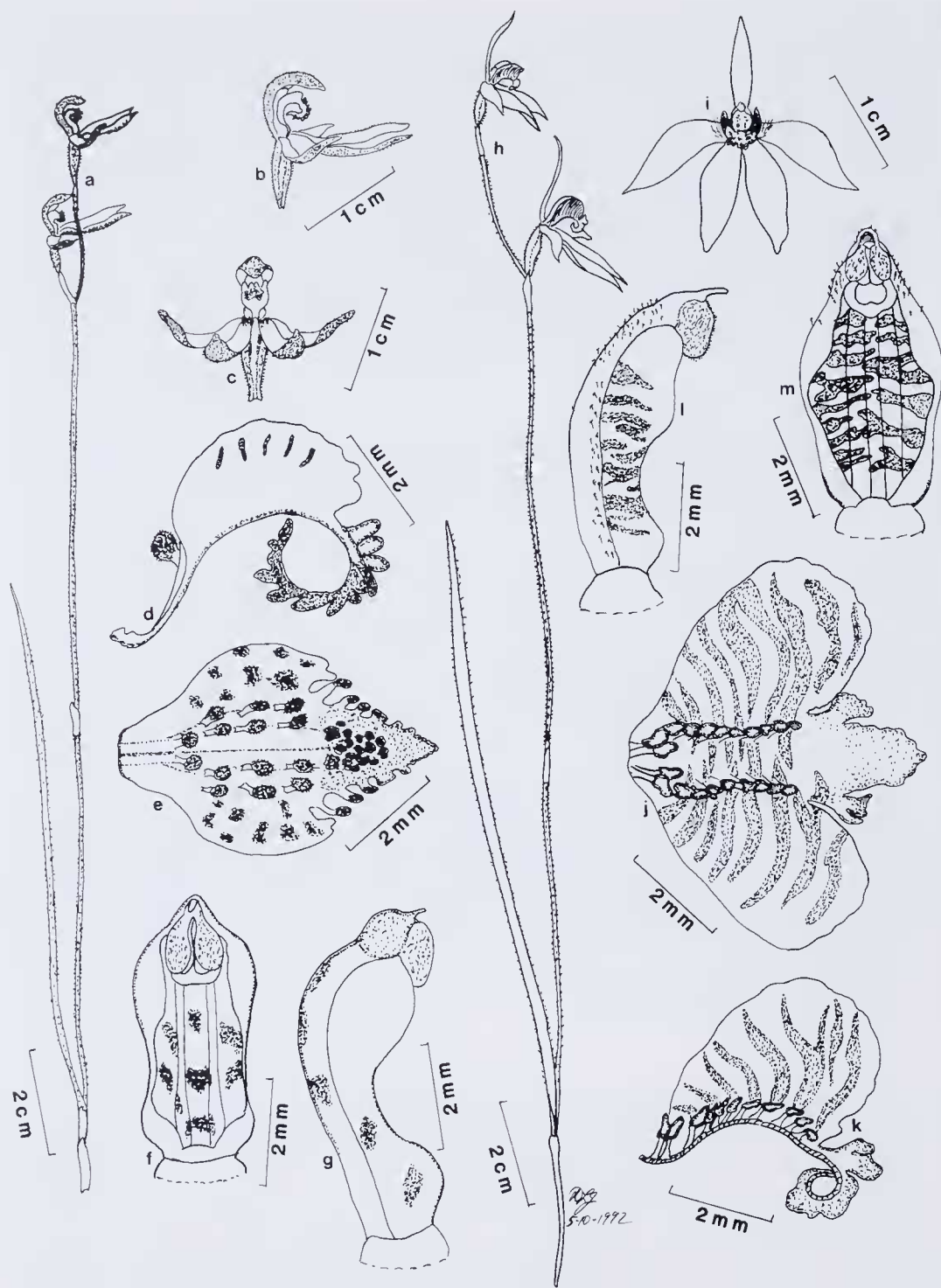


Fig. 1. a-g *Caladenia atrata* a — plant. b — flower from side. c — flower from front. d — labellum from side. e — labellum flattened out, from above. f — column from front. g — column from side. (drawn from the type collection). h-k *Caladenia hillmanii* h — plant. i — flower from front. j — labellum flattened out, from above. k — longitudinal section of labellum. l — column from side. m — column from front. (drawn from the type collection).

# CONSERVATION STATUS

Locally common but poorly conserved (one state reserve — D.Ziegeler pers. comm.).

# ETYMOLOGY

From the Latin *atratus*, dressed in black, in reference to the blackish exterior of the flowers resulting from the dense covering of glands.

# *Caladenia hillmanii* D.L.Jones, *sp. nov.*

*C. carneae* R.Br. affinis sed labello latiore quam longiore atro-purpureo vel atro-rubro et margine labelli non dentata sed ad basin cum 2 lobis prominentibus planis, differt.

TYPUS: New South Wales, Shoal Bay, 32°43'S, 152°10'E, 7 Sept. 1990, D.L.Jones 6404, C.Broers & G.Hillman (HOLOTYPE: CBG; ISOTYPE: CBG, SYD, BRI, MEL).

Hirsute, solitary terrestrial herb. *Leaf* 6–12 cm × 3–4 mm, linear, semi-erect, dark green, sparsely hirsute with transparent, patent, eglandular trichomes to 2 mm long. *Inflorescence* 15–25 cm tall, slender, wiry, green, with patent glandular trichomes c. 0.5 mm long mixed with eglandular trichomes similar to those on the leaf. *Sterile bracts* 10–15 mm × 3–4 mm, linear-oblong, erect and hardly sheathing, acuminate, externally hirsute with trichomes similar to those on the stem. *Fertile bracts* 8–15 mm × 3–4 mm, linear-oblong, obtuse, closely sheathing, externally hirsute. *Ovary* 10–13 mm long, linear obovoid, densely glandular. *Flowers* 1 or 2, c. 25 mm across, bright pink internally with a dark reddish purple labellum, externally greenish or brownish from dense glands, a darker central stripe apparent on each segment, floral odour undetectable; dorsal sepal erect, lateral sepals porrect, hardly divergent, petals widely spreading, curving forwards slightly in distal half. *Dorsal sepal* 13–18 mm × 2–3.5 mm, linear-lanceolate, acute to acuminate, internally glabrous, externally densely covered with sessile and shortly stalked, ovoid to globular, brownish glands. *Lateral sepals* 13–20 mm × 3–6 mm, asymmetrically lanceolate, slightly falcate, subacute, internally glabrous, externally glandular. *Petals* 12–17 mm × 3–5.5 mm, obliquely lanceolate, slightly falcate, curved slightly forwards in distal half, acute, internally glabrous, externally glandular. *Labellum* articulated on a short claw c. 0.3 mm × 0.6 mm, dark reddish pink to reddish purple, with prominent, narrow, dark red transverse bars, deeply 3-lobed. *Lamina* 6–8 mm × 8–10 mm, transversely ovate to almost reniform in outline when flattened, erect in proximal third, curved forwards in distal two-thirds, apex porrect or recurved; lateral lobes c. 3.5 mm wide, erect and loosely column-embracing, entire; mid-lobe c. 3 mm long, linear-deltate, porrect or more usually recurved, bright yellow, basal margins with a large, flat pair of dark yellow, blunt, marginal calli, distally the margins slightly crenulate-undulate to the apex. *Lamina calli* yellow, in 2 rows extending just onto the base of the mid-lobe; basal calli 4, head ovoid, c. 0.5 mm across, papillate, stalk c. 0.5 mm long, white; longest lamina calli c. 1 mm long, head c. 0.4 mm across, ovoid, erect to flat, papillate, stalk c. 0.4 mm long, white. *Column* 6.5–7 mm × 3.5–3.7 mm, erect, curved forwards in distal third, greenish stained with purple and with numerous, prominent, dark red, transverse, anterior bands, broadly winged, with stalked glandular trichomes scattered on the dorsal surface; central anterior ridge c. 1.3 mm wide. *Anther* c. 1.2 mm × 1.2 mm, pink to mauve, densely papillate, with a prominent linear rostrum. *Pollinia* 4, c. 1.2 mm long, flat, yellow, mealy. *Stigma* c. 1.2 mm wide, more or less circular, sunken, green. *Capsule* not seen. (Fig. 1 h–m).

# DISTRIBUTION AND HABITAT

Endemic to New South Wales where widely distributed but sporadic in coastal districts between Nelson Bay and Ulladulla. This species, which may be

locally common, is restricted to light coastal forests on deep, white to grey sandy soils.

#### FLOWERING PERIOD

September and October.

#### NOTES

*Caladenia hillmanii* is a distinctive member of the *C. carnea* complex. It can be readily recognised by its dark purple red to dark red labellum which is broader than long (obvious when flattened), and with the marginal teeth of the labellum mid-lobe being reduced to two, prominent flat structures situated near the base. The new species may grow sympatrically with *C. carnea* in some localities but hybrids are unknown.

#### ETYMOLOGY

Named after George Hillman of Nelson Bay who has recognised the distinctiveness of this taxon for many years and has been of valuable assistance to my research.

#### *Diuris ochroma* D.L.Jones *sp. nov.*

*D. venosae* Rupp affinis sed floribus luteolis minus striatis, lobis lateralibus labelli angustioribus, et callo labelli majoribus cum costis inconspicuis in lobum medium laminae radiantibus, differt.

**TYPUS:** Victoria, Wonnangatta River valley, 16.5 km north of Wonnangatta Homestead ruins, 37°10'S, 146°47'E, 530 m, 30 Nov. 989, *J.Taylor 2650 & M.Crisp* (HOLOTYPE: CBG).

Glabrous, terrestrial, solitary herb. *Leaves* 3 or 4, basal, linear, 18–30 cm × 3–5 mm, obliquely erect to lax, involute, green. *Inflorescence* 25–40 cm tall, slender. *Sterile bracts* 7–10 cm × 5–7 mm, lanceolate, acuminate, closely sheathing. *Fertile bracts* 15–35 mm × 3–5 mm, lanceolate, acuminate, closely sheathing. *Flowers* 1–4, c. 25 mm across, semi-erect to semi-pendant, pale yellow with dark reddish purple striae. *Pedicels* 15–45 mm long, slender, straight or curved. *Dorsal sepal* ovate, 10–13 mm × 7–9 mm, projected forwards, cucullate and tightly column-embracing in the proximal half, then obliquely erect, obtuse, pale yellow with prominent dark reddish purple striae. *Lateral sepals* oblanceolate to ensiform, 14–19 mm × 1.5–3.5 mm, obliquely deflexed below the labellum, parallel to slightly divergent, margins involute, acuminate, green with reddish purple, longitudinal striae. *Petals* incurved or spreading horizontally; lamina asymmetrically ovate, 7–9 mm × 4–5 mm, obtuse, anterior surface pale yellow, dorsal surface with reddish purple striae at the base; claw 6–8.5 mm long, linear, green to purplish, widening just near the apex. *Labellum* 13–16 mm long, porrect in proximal fifth then obliquely decurved, pale yellow with reddish purple striae on the lateral lobes, deeply 3-lobed; lateral lobes more or less oblong, 2.5–3 mm × c. 1.5 mm, obliquely erect, divergent, pale yellow with prominent dark reddish purple striae, apex shortly and irregularly laciniate, margins densely beset with short, clear, siliceous cells; mid-lobe broadly ovate in outline when flattened (8.5–11 mm across), more or less flat with an erect, rounded central ridge, pale yellow with some purplish markings, obtuse, margins slightly irregular, purplish, basal margins beset with short, siliceous cells. *Labellum callus* complex, consisting of 2–4 more or less parallel, rounded ridges, incurved near the apex, densely beset with clear, acicular siliceous cells, the central ridges coalescing near the expanded part of the mid-lobe and extending as a more or less single ridge to the apex, faint ridges radiating laterally onto the mid lobe. *Column* c. 4 mm × 3 mm, projected forwards from the end of the ovary. *Anther* c. 2.5 mm × 2.5 mm, broadly ovate, cream and pale brown. *Pollinarium* c. 3 mm × 2 mm; pollinia linear-clavoid, white; viscidium c. 0.4 mm across, more or less oblong. *Column wings* c. 3 mm long, linear-oblong,

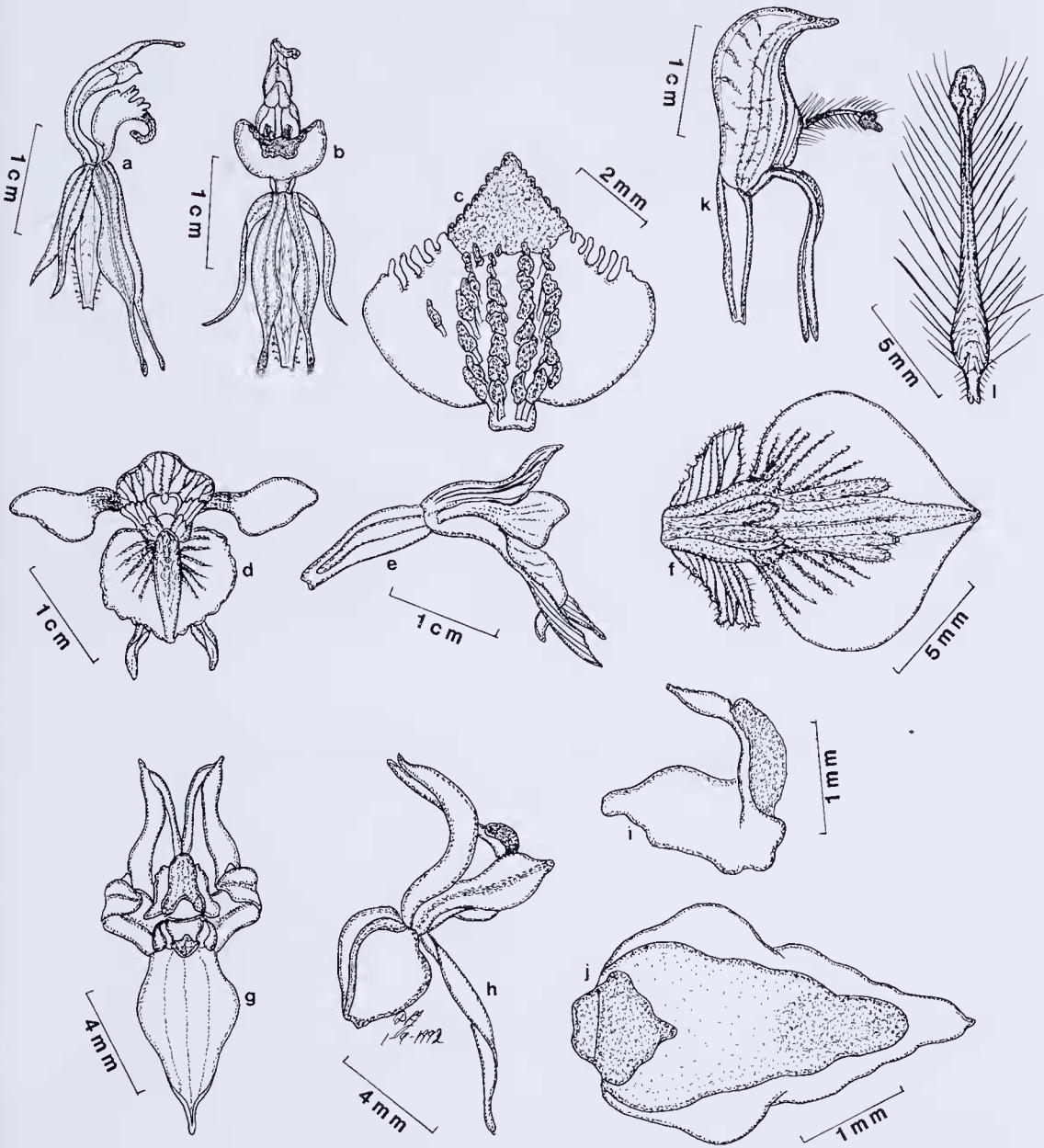


Fig. 2. a-c *Caladenia amoena* a — flower from side. b — flower from front. c — labellum flattened out, from above. (drawn from the type collection). d-f *Diuris ochroma* d — flower from front. e — flower from front. f — labellum flattened out, from above. (drawn from the type collection). g-j *Prasophyllum suaveolens* g — flower from front. h — flower from side. i — labellum from side. j — labellum flattened out, from above. (drawn from the type collection). k-l *Pterostylis tasmanica* k — flower from side. l — labellum flattened out, from above. (Badger Head Rd, Tasmania, 20 Oct 1986, H. Ronken, CBG).



tapered near the apex, irregularly lobed, white with purple markings, about as long as the anther. *Stigma* higher than anther, white with purple markings. *Capsule* 10–12 mm × 4–5 mm, obovoid. (Fig. 2 d–f)

#### DISTRIBUTION AND HABITAT

Locally abundant in the Wonnangatta Valley, north-eastern Victoria but probably more widespread and overlooked due to confusion with other species. It grows in herbfield in silty clay to peaty soils.

#### FLOWERING PERIOD

November and December.

#### NOTES

*Diuris ochroma* has affinities with *D. venosa* but can be immediately distinguished by its pale yellow flowers (mauve, lilac or bluish in *D. venosa*) which have fewer and less prominent striae. It also has shallowly incised lateral lobes on the labellum and a much larger, more complex lamina callus which has faint accessory ridges radiating onto the lamina of the mid-lobe. *D. ochroma* is well isolated from *D. venosa* which is restricted to altitudes above 1500 m on the Northern Tablelands of New South Wales. In Victoria the new species has been linked with *D. lanceolata*. It can be distinguished from that species by the dark striae on the tepals and the lamina callus which is more complexly lobed and with faint accessory ridges radiating onto the midlobe. The callus of *D. lanceolata* consists of 2 main lobes with a third extending onto the midlobe but without any associated radiating ridges.

#### CONSERVATION STATUS

Poorly known but locally common and not conserved; suggest 2K by the criteria of Briggs and Leigh (1989).

#### ETYMOLOGY

From the Greek *ochroma*, pale, wan; in reference to the pale yellow flowers.

#### *Prasophyllum suaveolens* D.L.Jones & R.Bates *sp. nov.*

*P. fusco* R.Br. affinis sed statura humiliore, floribus parvioribus fragrantissimis, callo labellorum laevi incrassato in tertia parte distali, et columna brevi lata proportionem differt.

TYPUS: Victoria, Vite Vite, 37°53'S, 143°11'E, 29 Nov. 1992, *D.L.Jones 10872*, *P.Barnett & G.Beilby* (HOLOTYPE: CBG; ISOTYPE: CBG, MEL, AD, NSW).

Slender terrestrial tuberous herb 10–25 cm tall. *Tuberoïds* ovoid to obovoid, 6–10 mm across. *Leaf* linear-terete, 15–20 cm long, bright green, base reddish, free lamina erect, often partially withered at anthesis. *Floral bracts* broadly ovate-elliptical, *c.* 1.5 mm × 1.3 mm, subacute. *Ovary* obovoid-pyriform, *c.* 3 mm × 2.5 mm, shiny green, set at about 40 degrees to the rhachis, sessile. *Inflorescence* a narrow, loose spike 5–10 cm long, consisting of 10–25 flowers. flowers 4–5 mm across, green to yellowish green with some reddish markings, opening widely, strongly fragrant. *Dorsal sepal* linear ovate-lanceolate, 4–5 mm × 2–2.3 mm, green with reddish striae, subacute. *Lateral sepals* linear-lanceolate, 2–3 mm × 1–1.2 mm, free or connate at the base, strongly recurved, subacute, distal margins involute. *Petals* narrowly obovate, 4–4.5 mm × *c.* 1.5 mm, green with a reddish central stripe, obliquely erect, incurved, subacute. *Labellum* ovate-lanceolate in outline when flattened, greenish-cream to pinkish green, narrowed to a short basal claw, slightly gibbous at the base when viewed from the side, porrect in proximal half, distal half recurved at right angles, with entire or slightly irregular margins, the apex often recurved, apiculate; callus ovate-lanceolate, fleshy, green, shallowly channelled, margins entire, prominently thickened and fleshy in distal third,



extending nearly to the labellum apex. *Column* c. 1.3 mm × 1.5 mm, porrect from the end of the ovary, hardly visible from the side in the open flower; appendages linear-oblong, c. 1 mm × 0.5 mm, pale green, truncate or emarginate. *Anther* ovate, c. 1 mm × 1 mm, purplish. *Pollinarium* c. 0.9 mm long; viscidium ovate, c. 0.13 mm long, white; hamulus ligulate, c. 0.2 mm long; pollinia 4, linear-clavoid, c. 0.7 mm long, yellow, sectile. *Stigma* transversely quadrate, c. 1 mm × 0.6 mm, the rostellum slightly higher than the appendages. *Capsules* obovoid, c. 3.5 mm × 2 mm, shiny, green or reddish. (Fig. 2 g–j)

#### DISTRIBUTION AND HABITAT

Endemic in south-western Victoria where it grows in open grassland and sparse woodland in red-brown loam. The vegetation is dominated by tussock grasses, particularly species of *Danthonia* and *Themeda triandra*.

#### FLOWERING PERIOD

Mid October to mid November.

#### NOTES

This species, part of the *Prasophyllum fuscum* complex, can be distinguished by its dwarfish stature, much smaller, strongly fragrant flowers, a broad, smooth labellum callus which is prominently thickened in the distal third and a short, proportionately broad column. It has been linked with *Prasophyllum* sp. *A sensu Flora of Victoria* Vol. 2. but is readily distinguished from that species by its much smaller flowers. The flowers of *P. suaveolens* readily emit a strong, spicy fragrance in warm weather.

#### CONSERVATION STATUS

Apparently once widespread but now restricted to small relict areas of grassland, principally along roadsides and in railway reserves. About 6 localities in addition to the type locality have been located (K.McDougall pers. comm.), but the identity of the species at each site needs to be confirmed. Suggest 2RC according to Briggs and Leigh (1989).

#### ETYMOLOGY

From the Latin *suaveolens*, fragrant, smelling sweetly.

#### *Pterostylis atrans* D.L.Jones sp. nov.

*P. obtusae* R.Br. affinis sed floribus parvioribus, suggestu sinus protrudenti minus, apicibus petalorum et sepalorum dorsalium rubro-fuscis, petalis angustioribus, sepalis lateralis apicibus discretis clavigeris leniter et sepalo dorsali apice longiore filiformi differt.

**TYPUS:** Australian Capital Territory, Brindabella Ranges, c. 4.3 km along Bendora Dam Rd from Bulls Head, 35°25'S, 148°45'E, 22 Feb. 1992, D.L.Jones 9092 & B.E.Jones (HOLOTYPE: CBG; ISOTYPE: CBG, MEL, NSW, HO).

Tuberous terrestrial herb growing in colonies. *Rosette* separate; leaves 3–5, ovate-oblong, 1–3.5 cm × 1–2 cm, dark green, entire or slightly irregular, obtuse; petioles 4–15 mm × c. 1 mm, not winged. *Flowering plants* 15–30 cm tall. *Scape* slender, smooth. *Cauline leaves* 4 or 5, 1–3 cm × 3–5 mm, ovate-lanceolate, sheathing at the base, long-acuminate, basal 1 or 2 reduced and bract-like. *Flower* solitary (rarely 2), 1.4–2 cm long, translucent white, striped and suffused with green, red-brown towards the apex of the galea; galea gibbous at the base then erect before bending forwards then strongly decurved to the apex. *Dorsal sepal* 2.5–3.2 cm × 8–12 mm, inflated at the base then constricted and tapered to the apex, with a linear-filiform apical point 5–9 mm long, translucent white with dark green stripes, red-brown towards the apex. *Lateral sepals* erect, tightly embracing the galea; sinus protruding as a prominent platform-like bulge when viewed from the

side, flat, slightly notched or raised when viewed from the front; conjoined part 8–12 mm × 8–12 mm, narrowed to *c.* 3 mm across at the base, white with dark green stripes and suffusions, the upper margins involute, suddenly tapered into the free points; free points 15–20 mm long, linear-clavoid, involute, erect, held high above the galea. *Petals* obliquely oblong-lanceolate, 1.5–2.5 cm × 4–5 mm, falcate, subacute, central part white, green in proximal half, red-brown towards the apex; flange *c.* 1 mm across, flat, obtuse. *Labellum* erect, curved forwards in the distal third, the tip obscure or just protruding above the sinus in the set position; lamina oblong-elliptical, 4–5 mm × 2.5–3 mm, green and light brown, dark brown towards the apex, broadly obtuse; callus *c.* 0.8 mm across, slightly raised, expanded at the apex; basal appendage 3.5–4 mm long, linear, sharply incurved near the middle, apex penicillate. *Column* 9–11 mm long, bent away from the ovary at about 50 degrees then erect, green. *Column wings* 3.5–4 mm long; basal lobe *c.* 1.2 mm × 1 mm, at an angle of about 40 degrees, inner margins incurved, sparsely adorned with short white cilia, apex obtuse; mid section *c.* 2 mm long, dark green to red-brown; apical lobe *c.* 0.6 mm long. *Stigma* oblong-ovate, *c.* 3 mm × 1.8 mm, raised. *Anther* *c.* 1 mm long, shortly rostrate. *Pollinia* 1.2–1.4 mm long, linear to linear-clavate, yellow, mealy. *Capsule* obovoid, 1.2–1.6 cm × 3–5 mm. (Fig. 3 a–d)

#### DISTRIBUTION AND HABITAT

Widely distributed in southern New South Wales, Australian Capital Territory, Victoria and Tasmania. The new species typically occurs in high rainfall regions and usually grows in tall forests in the ranges and foothills. In some localities it may also extend to coastal woodlands. Soils are commonly well-structured krasnozems but the species may also grow in grey clay loams and sandy loams.

#### FLOWERING PERIOD

November to April.

#### NOTES

*Pterostylis atrans* has been commonly confused with *P. obtusa* R.Br. (e.g. Willis 1970, Curtis 1979), but that species is now known to be restricted to central and northern New South Wales and possibly also Queensland. *Pterostylis atrans* can be distinguished by its smaller flowers with a less prominent sinus platform, red-brown colouration in the tips of the petals (green in *P. obtusa*) and dorsal sepal, narrower petals (6–7 mm in *P. obtusa*), slightly clavoid free points on the lateral sepals and a longer filiform tip on the dorsal sepal (3–6 mm long in *P. obtusa*). It is also superficially similar to *P. decurva* R.Rogers but with much smaller flowers and a much shorter labellum the tip of which is obscure or just visible above the sinus in the set position. Sporadic hybrids may occur between *P. atrans* and *P. decurva* where the two grow in close proximity.

#### CONSERVATION STATUS

Widespread and well conserved.

#### ETYMOLOGY

From the Latin *atrans*, darkening, in reference to the dark red-brown colouration towards the apex of the galea.

#### *Pterostylis commutata* D.L.Jones *sp. nov.*

*P. bisetae* Blackmore et Clemesha affinis sed floribus viridibus, sepalis lateralibus ellipticis angustioribus, petalis latioribus, et labello obovato-spathulato tenui prope basin contractam differt.

TYPUS: Tasmania, Charlton, Ross district, 42°06'S, 147°31'E, 14 Jan. 1987, L. Gilfedder (HOLOTYPE: HO).

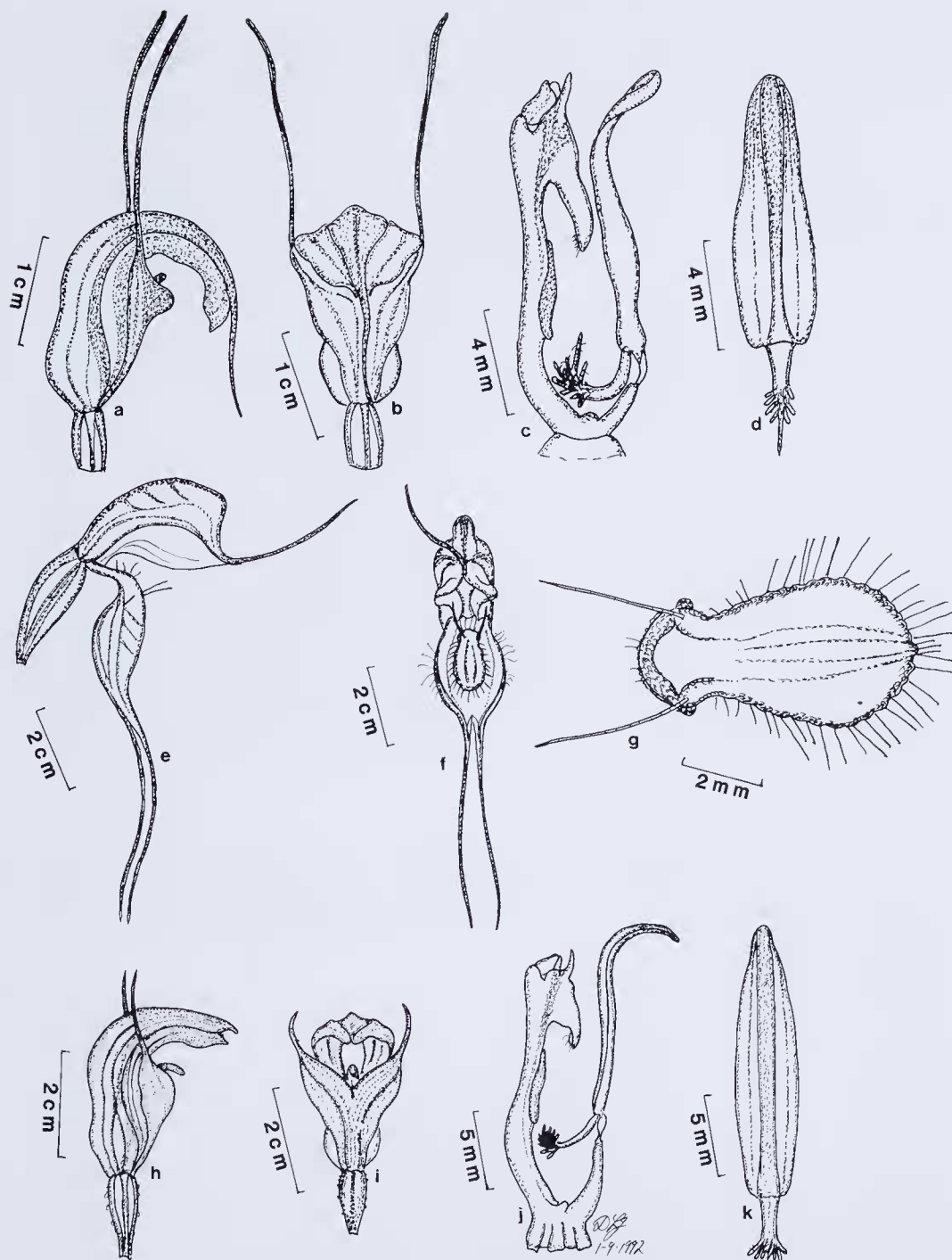


Fig. 3. a-d *Pterostylis atrans*. a — flower from side. b — flower from front. c — column and labellum from side. d — labellum flattened out, from above. (drawn from the type collection). e-g *Pterostylis commutata*. e — flower from side. f — flower from front. g — labellum flattened out, from above. (Ross, Tasmania, 5 Jan. 1987, H. Ronken, CBG). h-k *Pterostylis monticola*. h — flower from side. i — flower from front. j — column and labellum from side. k — labellum flattened out, from above. (drawn from the type collection)



Solitary, tuberous, terrestrial herb. *Leaves* narrowly elliptical to narrowly obovate, 15–30 mm × 4–8 mm, sessile to subsessile, subacute to acute, 6–10 in a sparse, radical, stem-encircling rosette, usually senescent at flowering. *Scape* 10–22 cm tall, slender, with 3 or 4 closely sheathing, ovate to lanceolate, acute to acuminate stem leaves. *Pedicels* 6–12 mm long, slender, curved. *Ovary* 5–8 mm long. *Flowers* 1–5, transparent with bright green lines and patches in the galea and lateral sepals, porrect; galea gibbous at the base, more or less gently curved, decurved suddenly to the apex; proximal petal flanges well developed but not closing off the base of the galea. *Dorsal sepal* 16–19 mm long, cucullate, obliquely erect, abruptly decurved in distal quarter, green with dark green lines and transparent areas, apical point 15–20 mm long, filiform, acuminate, upcurved. *Lateral sepals* deflexed, green with dark green lines and transparent areas; conjoined part deeply concave, 9–12 mm × 7–8 mm, the margins slightly incurved, with numerous white trichomes *c.* 1 mm long; sinus narrow, the lobes nearly parallel; free points 22–30 mm long, filamentous, more or less parallel. *Petals* broadly obovate-lanceolate, 17–21 mm × 5–6 mm, narrowed and curved at the base, apex long-acuminate to filiform, transparent with green lines, dorsal ridge with numerous trichomes; proximal flange moderately well developed. *Labellum* highly irritable on a curved claw *c.* 3 mm long; lamina obovate-spathulate, 6–7 mm × 3.5–4 mm, dark green, very thin-textured, prominently constricted in proximal quarter, widest towards the apex, margins irregularly undulate-sinuate, apex upcurved; lateral margins with 15–22 pairs of short, stiff, spreading white trichomes *c.* 1 mm long; basal lobe hardly raised, sloped backwards, a pair of prominent, erect trichomes *c.* 3.5 mm long arising from a swollen area near the constriction; underside with a narrow central channel extending nearly to the apex, bordered by a band of pale green, siliceous cells. *Column* 16–18 mm long, curved evenly throughout. *Column wings* *c.* 4.2 mm × 3 mm, more or less rectangular, anterior margins incurved, ciliate; barrier cilia moniliform, entire. *Stigma* 7–8 mm × 2–2.3 mm, elliptical, upper margins irregularly crenate. *Anther* *c.* 1.3 mm long, obtuse. *Pollinia* *c.* 2 mm long, linear to linear-clavate, yellow, mealy. *Capsule* not seen (Fig. 3 e–g).

#### DISTRIBUTION AND HABITAT

Endemic in Tasmania where confined to the lowest rainfall region in the state (*c.* 500 mm per annum), being known only from the vicinity of Ross in the midlands. It grows in red-brown loam amid grasses and low shrubs, sometimes amongst rocks.

#### FLOWERING PERIOD

December to February.

#### NOTES

*Pterostylis commutata* is part of the complex of taxa surrounding *P. biseta* Blackmore and Clemesha. It can be distinguished from *P. biseta* by its greenish flowers (brown in *P. biseta*), narrower, elliptical lateral sepals, broader petals and a very thin-textured, obovate-spathulate labellum markedly constricted near the base. *Pterostylis biseta* has lateral sepals 14–16 mm across and petals 7–8 mm wide. The new species also has similarities with *P. planulata* D.L.Jones & M.A. Clem. but this species has the conjoined part of the lateral sepals nearly flat and an oblong-obovate labellum hardly constricted at the base.

#### CONSERVATION STATUS

Very restricted, rare and conserved in Tunbridge Nature Reserve; suggest 2VC according to Briggs & Leigh (1989).

## ETYMOLOGY

From the Latin *commutatus*, changed, altered, in reference to adaptation of the species following isolation from related taxa.

***Pterostylis monticola* D.L.Jones sp. nov.**

*P. alpinae* R.Rogers affinis, robustiore et floribus maximis, sinu e latere visa protrudenti curvato leniter, et apicibus discretis sepalorum erectis supra galeam differt.

TYPUS: Australian Capital Territory, Brindabella Ranges, just south of Bendora Arboretum, 35°25'S, 148°48'E, 14 Feb. 1993, D.L.Jones 11355 & B.E.Jones (HOLOTYPE: CBG; ISOTYPE: CBG, MEL, NSW).

Tuberous terrestrial herb growing in colonies. *Rosette* semi-basal around the scape to cauline; leaves 3–5, elliptical, lanceolate or oblanceolate, 4–9 cm × 1.5–2.5 cm, dark green above, paler beneath, entire or slightly undulate, obtuse to subacute; petioles 2–10 mm × 2–3 mm, prominently winged. *Scape* 20–45 cm tall, slender, prominently scabrid. *Sterile bract* lanceolate, 3–6 cm × 9–15 mm, sheathing at the base. *Fertile bract* similar. *Ovary* 8–12 mm long, ribbed, scabrid. *Flower* solitary, 40–50 mm long, translucent white striped and suffused with dark green; galea gibbous at the base then erect before curving forwards, then flat or slightly decurved to the apex. *Dorsal sepal* 4–6 cm × 18–23 mm, inflated at the base then constricted and tapered to the acute apex, white with a broad, dark green median stripe, green margins and apex and about 8 prominent green nerves. *Lateral sepals* erect, loosely embracing the galea leaving a slight lateral gap; sinus protruding as a slight bulge when viewed from the side, broadly vee-ed when viewed from the front; conjoined part 14–18 mm × 12–16 mm, narrowed to c. 4 mm across at the base, green with darker stripes, the ventral surface minutely scabrid, the upper margins inrolled, gradually tapered into the free points; free points 15–20 mm long, filiform, involute, erect, held high above the galea. *Petals* obliquely oblong-lanceolate, 3–5 cm × 7–9 mm, falcate, acute, proximal central area white, rest green; flange c. 1.3 mm across, flat, obtuse. *Labellum* erect, curved forwards prominently in the distal quarter, the apex protruding prominently through the sinus in the set position; lamina narrowly elliptical-lanceolate to narrowly oblong-elliptical, 16–20 mm × 3–4.5 mm, tapered to the obtuse apex, greenish with brown margins in the proximal half, becoming wholly dark brown towards the apex; callus c. 1 mm across, raised, slightly expanded at the apex; basal appendage 3–3.5 mm long, broadly linear, shallowly curved, apex deeply penicillate. *Column* 18–22 mm long, bent away from the ovary at about 50° then erect, pale green with brown markings. *Column wings* 6–7 mm long; basal lobe 3–3.5 mm × c. 2.2 mm, white, at an angle of about 45°, apex obtuse, inner margins incurved, sparsely adorned with short white cilia; mid-section c. 3.5 mm long, dark green; apical lobe linear, c. 1.6 mm long, curved, subacute. *Stigma* oblong-elliptical, 5–6 mm × c. 2 mm, raised. *Anther* c. 2 mm long, shortly rostrate. *Pollinia* linear-clavate, 2–2.2 mm long, yellow, mealy, 22–26 mm × 10–12 mm, obovoid, ribs slightly scabrid. (Fig. 3 h–k).

## DISTRIBUTION AND HABITAT

Occurs in eastern Victoria, Australian Capital Territory and south-eastern New South Wales with a disjunct northern population at Barrington Tops. The species grows in montane forests and subalpine shrubland, usually in moist, grassy areas, soaks and near streams. Soils are usually well-structured loams and krasnozems.

## FLOWERING PERIOD

December to March.

## NOTES

*Pterostylis monticola* has been confused with *P. alpina* but has much larger flowers (4–5 cm long) with the sinus protruding in a shallow curve when viewed from the side and the free points of the sepals erect above the galea. By contrast the flowers of *P. alpina* are about 3 cm long, with the sinus protruding prominently in an abrupt curve when viewed from the side and the free points of the sepals reflexed behind the galea. *Pterostylis monticola* flowers in summer whereas *P. alpina* is spring flowering (August to October). *Pterostylis monticola* also has similarities with *P. furcata* Lindley but whereas the latter has a smooth scape, that of the new species is scabrid. *Pterostylis monticola* grows at much higher elevations than *P. alpina*, with the latter mainly occurring in the foothills and lower slopes of the main ranges.

## CONSERVATION STATUS

Widespread, locally common and conserved in National Parks.

## ETYMOLOGY

From the Latin *mons*, a mountain, and *cola*, dweller; in reference to the montane habitat.

***Pterostylis tasmanica* D.L.Jones sp. nov.**

*P. plumosae* L.Cady affinis statura humiliore, foliis et floribus parvioribus, floribus autogamatis, labello plumosiore dense et apice galeae brevior non-attenuata differt.

TYPUS: Tasmania, Rebecca Creek, north of Temma, 41°11'S, 144°40'E, 5 Nov. 1990, D.L.Jones 7030 & C. H. Broers (HOLOTYPE: CBG; ISOTYPE: HO, MEL).

Tuberous terrestrial herb growing in loose groups. *Leaves* 8–14, ovate-elliptical to elliptical-lanceolate, 1–2.4 cm × 3–7 mm, dark green, some with a few whitish variegations, the lower ones petiolate, arranged in a tight rosette, distal ones sessile and closely stem-embracing, apex acuminate; petioles 1–8 mm × 1–1.5 mm, narrowly winged. *Flowering plants* 8–14 cm tall. *Scape* slender, smooth. *Flower* solitary (rarely 2), 1.8–2.5 cm long, translucent green with darker green longitudinal and transverse veins, brownish towards the apex of the galea and lateral sepals; galea erect in proximal two-thirds then obliquely erect or curved forwards nearly at right angles. *Dorsal sepal* 18–24 mm × 12–13 mm, inflated at the base and tapered to the apex, with a short apical point 0.5–1.5 mm long. *Lateral sepals* deflexed; conjoined part 7–9 mm × 3–4 mm, narrowed to c. 2 mm across at the base, with a thickened, dark green central pad, the margins incurved; free points 7–11 mm long, linear, thickened, usually brown, parallel or slightly divergent, apex subacute. *Petals* strongly asymmetric, falcate, 15–20 mm × 1.5–2 mm, dark green, narrowed in the distal half to an attenuated, long-acuminate apex; flange c. 0.5 mm across, obscure. *Labellum* porrect, curved, filiform, densely beset with yellow hairs, with an apical knob; lamina linear-filiform, 13–15 mm × c. 0.5 mm, widened into a narrowly ovate, slightly wrinkled base c. 1.5 mm across, then suddenly tapered into a short beak, tapered slightly from the base to the apex; trichomes 2–4 mm long, yellow, irregularly moniliform, a series of short, whitish erect hairs on the basal swelling; apical knob irregular, c. 2 mm × 1.3 mm, dark brown. *Column* 12–14 mm long, porrect from the end of the ovary. *Column wings* 4–5 mm long; basal lobe 1.5 mm × 1 mm, at an angle of about 20°, inner margins incurved, sparsely adorned with white cilia, apex obtuse; mid-section c. 3 mm long, transparent; apical lobe 3–4 mm, linear. *Stigma* c. 6–7 mm × 2.5 mm, elliptical, raised. *Anther* c. 1.8 mm long, shortly rostrate. *Pollinia* c. 2 mm long, oblong, yellow, mealy. *Capsule* obovoid, 1.2–1.6 cm × 6–8 mm, asymmetrical. (Fig. 2 k–l).

## DISTRIBUTION AND HABITAT

Occurs in southern Victoria, Tasmania (widespread) and New Zealand (North Island and northern parts of South Island). It commonly grows in wood-



land and heathland in coastal and near-coastal localities. Soils are usually sandy loams derived from Tertiary sediments.

#### FLOWERING PERIOD

October to December.

#### NOTES

*Pterostylis tasmanica* has been included with *P. plumosa* L.Cady but is readily distinguished by the shorter habit, smaller leaves arranged in a relatively tight rosette and smaller, self-pollinating flowers with a more densely plumose labellum and a short apical point on the galea, imparting a blunt appearance to the flower. *Pterostylis plumosa* grows up to 25 cm tall, has leaves to 4 cm × 10 mm arranged in a relatively loose rosette and flowers to 4.5 cm long with an apical point on the dorsal sepal to 4 mm long. *Pterostylis plumosa* is widespread in south-eastern Australia whereas *P. tasmanica* is restricted to southern Victoria, Tasmania and New Zealand.

#### CONSERVATION STATUS

Widespread and well conserved.

#### ETYMOLOGY

In reference to the distribution of the species being centred around Tasmania and the Tasmanian Basin.

#### NEW COMBINATION

Recent studies into the *rufa* group of *Pterostylis* by the author have clarified the status of *P. boormanii* Rupp, *P. squamata* R.Br. and *P. excelsa* M.A.Clem. The following species has been linked with all of these taxa but is distinct and requires recognition in its own right.

***Pterostylis valida* (Nicholls) D.L.Jones comb. & stat. nov.**

**BASEONYM:** *Pterostylis squamata* var. *valida* Nicholls, *Victorian Naturalist* 58:115, f. A-E (1941); **HOLOTYPE:** Victoria: Mt Tarrengower, Maldon, *J. von Bibra*, 23 Oct. 1941 (MEL!).

#### DISTRIBUTION AND HABITAT

Endemic in Victoria where known only from the type collection.

#### FLOWERING PERIOD

October and November

#### NOTES

This species is part of the *P. excelsa* complex (Clements 1989), but can be distinguished from all other related taxa by the narrower green flowers, a narrower labellum attenuated at the apex, fewer marginal cilia and a less developed basal lobe which lacks any cilia. The species is well preserved by excellent type material and has been clearly illustrated (Nicholls 1969, plate 342). This species is apparently a narrow endemic and as the type locality is completely alienated, the species is presumed to be extinct.

#### ETYMOLOGY

From the Latin *validus*, strong, robust.

## ACKNOWLEDGEMENTS

My research was funded in part by the Nell and Hermon Slade Trust, the Australian Biological Resources Survey and the Australian Orchid Foundation. I thank Neville Walsh and Alex George for furnishing the Latin diagnoses and Cam Beardsell for fruitful discussions and bringing the plight of *Caladenia amoena* to my attention. Corinna Broers provided competent technical assistance. Mark Clements contributed in many ways. I thank Bob Makinson, curator CBG and the Directors and staff of HO, MEL and SYD for their help. The following people assisted in various ways including the collection of material or provided information or hospitality; Paul Barnett, Bob Bates, Geoff Beilby, Peter Branwhite, Jeff Campbell, Mike Crisp, Tim Entwisle, Geoff Glare, George Hillman, Jeff Jeanes, Barbara Jones, Keith McDougall, Brian Molloy, Helen Richards, John Riley, Les Rubenach, Joan Taylor, Ron Tunstall, Hans Wapstra, Ron Williamson and David Ziegeler.

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Revised manuscript received 4 October 1993.